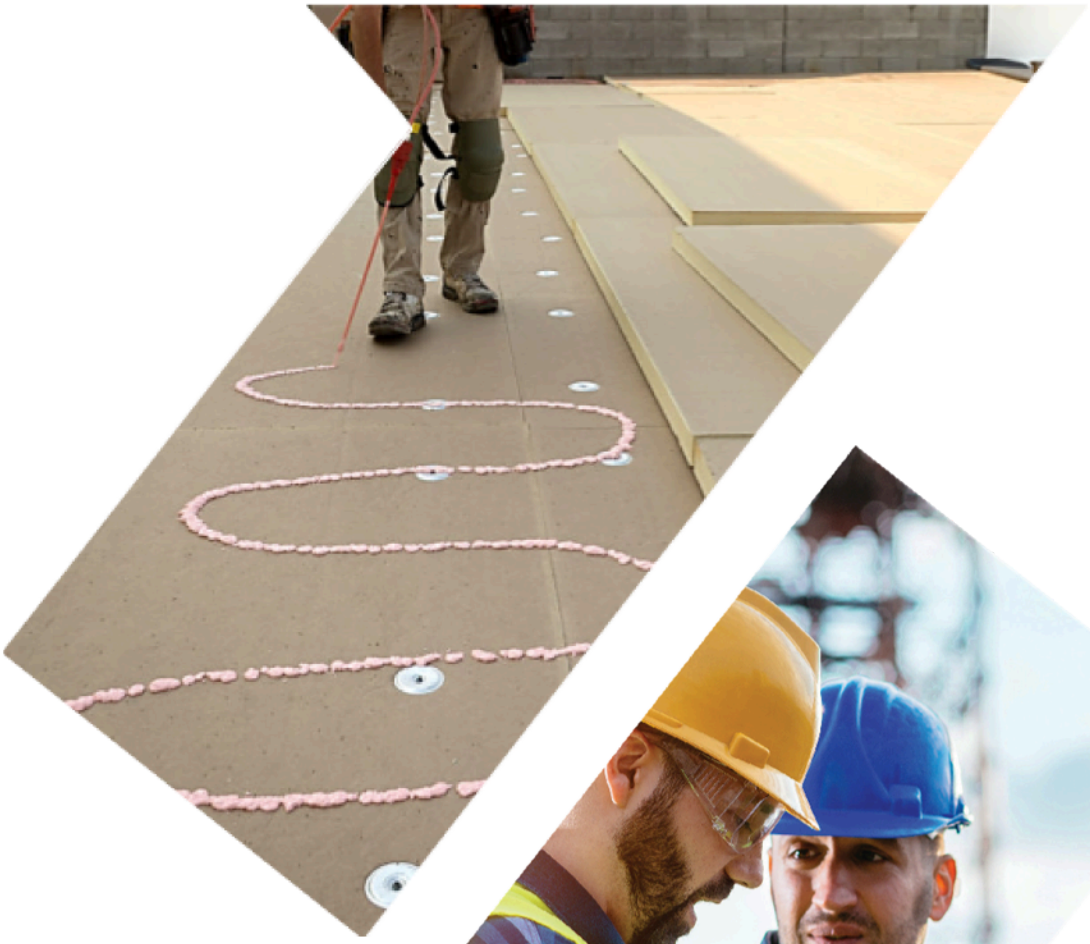
Insulation Usage Guide



siplast®

With you every step of the way

Table of Contents

Polyisocyanurate	1
Expanded Polystyrene – EPS	2
Extruded Polystyrene – XPS	3
Optim-R Insulation by Kingspan	4
DensDeck/DensDeck Prime/DensDeck StormX Prime	5
Securock Gypsum-Fiber Roof Board	6
DEXcell & DEXcell FA Glass Mat Roof Boards	7
Securock Cement Roof Board	8
DEXcell Cement Roof Board	8
High-Density Polyisocyanurate Cover Panel	9
High-Density Fiberboard	10
Asphaltic Roof Board	11
Perlite/High-Density Perlite	12

Polyisocyanurate

Polyisocyanurate foam board insulation is produced from a polyisocyanurate-based chemical sandwiched between fiberglass-reinforced organic felt facers or inorganic coated fiberglass facers. Polyisocyanurate products are available in two densities, 20 psi and 25 psi. See separate document for high-density polyisocyanurate cover Panel.

Panel Application Method

Hot Asphalt	A maximum panel size of 4 feet by 4 feet is required when panels are applied with hot asphalt.
Mechanical	When panels are mechanically attached over a metal deck, the panel thickness must be sufficient to span the flutes of the metal deck. Siplast minimum fastening requirements call for 1 fastener per 4 square feet of panel area. See published fastening schematics at www.siplast.com for specific fastening frequencies. Contact Siplast for fastening frequencies to meet specific codes/approvals.
Adhered	A maximum panel size of 4 feet by 4 feet is required when panels are applied with an Para-Stik, Parafast, Parafast LRF, or an approved insulation adhesive. See published schematics for bead spacing sequences.

Membrane Direct Application

Thermoplastic

PVC and PVC KEE:

1. Parasolo PVC Bonding Adhesive
2. Parasolo PVC Quick Spray Adhesive
3. Parasolo PVC Quick-lay Adhesive (Not applicable with PVC KEE)
4. Induction Welding
5. Mechanical attachment

TPO:

1. Parasolo TPO Bonding Adhesive
2. Parasolo TPO Quick Spray Adhesive
3. Induction Welding
4. Mechanical attachment

All Thermoplastic Fleece-Back

1. Parafast Adhesive T
2. Type III asphalt

*All other membrane applications require use of a Siplast approved cover panel. See separate document in this guide for approved use of a specific cover panel or contact Siplast Technical Services for additional information.

Note: A maximum individual flat-stock panel thickness of 2.7 inches is recommended. For configurations requiring more than 2.7 inches in total thickness, a multiple layer configuration is recommended.

Listings, Approvals, & Standards

c UL us LISTED — Refer to UL Product iQ for specific assemblies

FM APPROVED — Refer to RoofNav.com for specific assemblies

ASTM C1289:
Type II Class 1 Grade 2: 20-psi organic facer
Type II Class 1 Grade 3: 25-psi organic facer
Type II Class 2 Grade 2: 20-psi coated-glass facer
Type II Class 2 Grade 3: 25-psi coated-glass facer

Expanded Polystyrene - EPS

Expanded Polystyrene (EPS) is a rigid insulation board formed by expanding polystyrene beads into blocks and cutting the blocks into sheets. (Acceptable types are listed in the following table.)

Physical Properties

Type	Compressive Strength	Density
Type VIII	**13-psi**	**1.15 lb/ft^2**
Type II	**15-psi**	**1.35 lb/ft^2**
Type IX	**25-psi**	**1.8 lb/ft^2**
Type XIV	**40-psi**	**2.4 lb/ft^2**
Type XV	**60-psi**	**2.85 lb/ft^2**

Maximum Individual Panel Thickness: 6 inches

Maximum Panel Size: 4 feet by 4 feet

Application Methods

EPS panels are typically attached simultaneously with an approved cover/separator panel using approved fasteners at a minimum rate of 1 fastener per 4 square feet. See published schematics for fastening frequencies. All joints of the cover panel/ separator panel must be taped for torch or hot asphalt applications. In lieu of joint taping, a layer of asphalt felt or rosin sheet may be placed between the top layer of EPS insulation and the overlayment/separator panel. Contact Siplast for other possible attachment methods.

Notes: Testing or local code approvals may require a thermal barrier or fire barrier panel installed between the structural deck and the EPS panels. Siplast defers to the local building code requirements and/or the designer for determination of an appropriate thermal or fire barrier.

EPS panels may be applied over approved substrates using Para-Stik, Parafast, or Parafast LRF Adhesive. See published schematics at www.siplast.com for bead spacing sequences.

Siplast Roof Systems installed over insulation configurations incorporating EPS panels must utilize a membrane having a white surfacing. The use of a membrane having any other surface color must be approved in advance by the Siplast Technical Department.

*All membrane applications require use of a Siplast approved cover panel. See separate document within this guide for approved use of specific cover panel or contact Siplast Technical Services for additional information.

Listings, Approvals, & Standards

c UL us LISTED — Refer to UL Product iQ for specific assemblies.

FM APPROVED — Refer to RoofNav.com for specific assemblies.

1. ASTM C578

Extruded Polystyrene - XPS

Extruded polystyrene board is formed from a polystyrene polymer. Closed cells are integrally formed within the insulation materials during the expansion process. Continuous extrusion produces a tight and complete skin (free of open cells) to form on each side of the insulation board. XPS boards are extruded to a specific thickness during manufacturing. Panels that are planed following production are also available to remove the "skin," which will allow for application of panels in approved insulation adhesive. (Acceptable types are listed in the following table.)

Physical Properties

Type	Compressive Strength	Density
Type IV	**25-psi**	**1.45 lb/ft^2**
Type VI	**40-psi**	**1.8 lb/ft^2**
Type VII	**60-psi**	**2.2 lb/ft^2**
Type V	**100-psi**	**3 lb/ft^2**

Maximum Individual Panel Thickness: 4 inches

Application Methods

In conventional roof constructions, XPS panels must be attached simultaneously with an approved cover/separator panel using approved fasteners at a minimum rate of 1 fastener per 4 square feet. All joints of the cover/separator panel must be taped for torch or hot asphalt applied membrane. In lieu of joint taping, a layer of felt or rosin sheet can be placed between the top layer of XPS insulation and the cover/separator panel. Contact Siplast for other possible attachment methods.

Note: Testing or local code approvals may require a thermal barrier or fire barrier panel installed between the structural deck and XPS panels.

XPS panels with planed facers may be adhered over approved substrates in Para-Stik, Parafast, Parafast LRF, or an approved insulation adhesive. See published schematics for bead spacing sequences. Siplast defers to the local building code requirements and/or the designers for determination of an appropriate thermal or fire barrier.

Siplast Roof Systems installed over rigid insulation configurations incorporating XPS panels must utilize a membrane having a White surfacing. **The use of a membrane having any other surface color must be approved in advance by the Siplast Technical Department.**

*All membrane applications require use of a Siplast approved cover panel. See separate document within this guide for approved use of specific cover panel or contact Siplast Technical Services for additional information.

Listings, Approvals, & Standards

c UL us LISTED FM APPROVED

Refer to UL Product iQ for specific assemblies.
Refer to RoofNav.com for specific assemblies.

1. ASTM C578

Kingspan Optim-R® Vacuum Insulation Panels

Optim-R Vacuum insulation panels by Kingspan is comprised of a microporous core which is evacuated, encased and vacuum sealed in a thin, gas-tight envelope to provide optimum thermal resistance with the thinnest possible solution.

Optim-R, Polyisocyanurate, & Cover Panels

*The Siplast recommendations below are provided for guidance on how the Optim-R is best configured in general as an insulation layer beneath Siplast membrane systems.

Siplast recommends that wherever possible, an approved polyisocyanurate should be installed over all Optim-R insulation in addition to installation of a Siplast approved cover panel. At a minimum, a cover panel must be applied over the Optim-R panels.

It is recommended that the Optim-R panel be applied to an approved substrate using Parafast Adhesive with a maximum bead spacing of 12 inches on center, or according to Kingspan specifications and recommendations. The approved cover panel should also be applied using Parafast Adhesive to the Optim-R panel with a maximum bead spacing of 12 inches on center, or according to Kingspan specifications and recommendations.

Notes: Parafast Adhesive is the only Siplast adhesive recommended for use with Optim-R. Mechanical attachment of the Optim-R Panels is not approved for Siplast systems.

Siplast Membrane Installation

All membrane applications require the use of a Siplast approved membrane membrane cover panel. SBS Modified Bitumen torch and cold adhesive applications for the base ply require a layer of polyisocyanurate installed between the Optim-R and cover panel.

Kingspan Sales and & Technical Support

For Optim-R use as an overburden componate in protected assemblies or for further information beyond the recommendations provided above, please contact:

Phone: 800-241-4402
Email: info@kingspaninsulation.us

Website: www.kingspaninsulation.us

Optim-R is a registered trademark of Kingspan holding (IRL) Limited

Listings, Approvals, & Standards

c UL us LISTED

Refer to UL Product iQ for specific assemblies.

FM APPROVED

Refer to RoofNav.com for specific assemblies.

1. ASTM C1667
2. ASTM C165
3. ASTM D2126

DensDeck®/DensDeck Prime®
DensDeck StormX Prime®

DensDeck, DensDeck Prime, and DensDeck StormX Prime by Georgia Pacific consist of a silicone-treated gypsum core with embedded fiberglass facers on both sides. DensDeck Prime and DensDeck StormX Prime also have a surface that is treated with a non-asphaltic primer to enhance membrane adhesion.

Panel Application Method	
 Hot Asphalt	Maximum panel size of 4 feet by 4 feet. SBS modified bitumen base ply must be torch applied.
 Mechanical	Fasten DensDeck panels at the minimum rate of 1 fastener per 4 square feet of panel area. Contact Siplast for fastening frequencies to meet specific codes/approvals.
 Adhered	See published schematics for Siplast insulation adhesive bead spacing sequences on our website www.siplast.com.

Membrane Direct Application

SBS Modified Bitumen

1. Hot asphalt: Not approved.
2. PA-311 Series and SFT Adhesive: Approved over DensDeck panels mechanically attached or applied in Siplast insulation adhesive.
3. Torch: Approved. Prime DensDeck using PA-1125 or PA-917 Primer.
4. Self-Adhesive: Approved over panels that are mechanically attached or applied in Siplast insulation adhesive. Prime DensDeck using PA-1125 or PA-917 Primer.

*NOTE: DensDeck Prime and DensDeck StormX Prime are already pre-primed by the manufacturer and do not require additional primer.

Thermoplastic

PVC and PVC KEE:

1. Parasolo PVC Bonding Adhesive
2. Parasolo PVC Quick Spray Adhesive
3. Parasolo PVC Quick-lay Adhesive (Not applicable with PVC KEE)
4. Induction Welding
5. Mechanical attachment

TPO:

1. Parasolo TPO Bonding Adhesive
2. Parasolo TPO Quick Spray Adhesive
3. Induction Welding
4. Mechanical attachment

All Thermoplastic Fleece-Back

1. Parafast Adhesive T

Listings, Approvals, & Standards

Note: For liquid applied membranes please contact Siplast Technical Services for additional information

c UL us LISTED FM APPROVED

Refer to UL Product iQ for specific assemblies.
Refer to RoofNav.com for specific assemblies.

1. ASTM C79
2. ASTM E136

Securock® Gypsum-Fiber Board

SECUROCK Gypsum-Fiber Roof Board by USG Corp. is a fiber reinforced, gypsum panel manufactured without facers for use in low slope roofing systems.

Panel Application Method

 Hot Asphalt	Maximum panel size of 4 feet by 4 feet. The maximum asphalt temperature at the point of application should not exceed 455°F. SBS modified bitumen base ply must be torch applied.
 Mechanical	Fasten panels at the minimum rate of 1 fastener per 4 square feet of panel area. Contact Siplast for fastening frequencies and supplemental adhesion to meet specific codes/approvals.
 Adhered	See published schematics for Siplast insulation adhesive bead spacing sequences on our website www.siplast.com..

Membrane Direct Application

SBS Modified Bitumen

1. Hot asphalt: Approved Type III asphalt - Prime panels using PA-1125 or PA-917 Primer. (Note: Not Approved if panel is set in hot asphalt.)
2. PA-311 Series and SFT Adhesive: Approved.
3. Torch: Approved.
4. Self-Adhesive: Please note that priming may be necessary in some cases in order to meet certain code approval requirements.

Thermoplastic

PVC and PVC KEE:

1. Parasolo PVC Bonding Adhesive
2. Parasolo PVC Quick Spray Adhesive
3. Parasolo PVC Quick-lay Adhesive (Not applicable with PVC KEE)
4. Induction Welding
5. Mechanical attachment

TPO:

1. Parasolo TPO Bonding Adhesive
2. Parasolo TPO Quick Spray Adhesive
3. Induction Welding
4. Mechanical attachment

All Thermoplastic Fleece-Back

1. Parafast Adhesive T
2. Type III asphalt

Listings, Approvals, & Standards

Note: For liquid applied membranes please contact Siplast Technical Services for additional information

c UL us LISTED FM APPROVED

Refer to UL Products iQ for specific assemblies.
Refer to RoofNav.com for specific assemblies.

1. ASTM C1278

DEXcell® & DEXcell FA® Glass Mat Roof Boards

DEXcell & DEXcell FA Glass Mat Roof Boards consist of a silicone-treated gypsum core with embedded fiberglass facers on both sides. DEXcell FA Glass Mat Roof Board has a surface that is factory-primed with a non-asphaltic primer to enhance membrane adhesion.

Panel Application Method

 Hot Asphalt	Maximum panel size of 4 feet by 4 feet. SBS modified bitumen base ply must be torch applied.
 Mechanical	Fasten DEXcell panels at the minimum rate of 1 fastener per 4 square feet of panel area. Contact Siplast for fastening frequencies to meet specific codes/approvals.
 Adhered	See published schematics for Siplast insulation adhesive bead spacing sequences on our website www.siplast.com..

Membrane Direct Application

SBS Modified Bitumen

1. Hot asphalt: Not approved.
2. PA-311 Series and SFT Adhesive: Approved over DEXcell/DEXcell FA mechanically attached or applied in Siplast insulation adhesive.
3. Torch: Approved.
4. Self-Adhesive: Approved over panels that are mechanically attached or applied in Siplast insulation adhesive. Prime DEXCELL (unprimed) panel using PA-1125 or PA-917 Primer.

Thermoplastic

PVC and PVC KEE:

1. Parasolo PVC Bonding Adhesive
2. Parasolo PVC Quick Spray Adhesive
3. Parasolo PVC Quick-lay Adhesive (Not applicable with PVC KEE)
4. Induction Welding
5. Mechanical attachment

TPO:

1. Parasolo TPO Bonding Adhesive
2. Parasolo TPO Quick Spray Adhesive
3. Induction Welding
4. Mechanical attachment

All Thermoplastic Fleece-Back

1. Parafast Adhesive T
2. Type III asphalt

Listings, Approvals, & Standards

Note: For liquid applied membranes please contact Siplast Technical Services for additional information

c UL us LISTED FM APPROVED

Refer to UL Product iQ for specific assemblies.
Refer to RoofNav.com for specific assemblies.

1. ASTM C79
2. ASTM C139

Securock®Cement Roof Board
DEXcell®Cement Roof Board

Securock Cement Roof Board by United States Gypsum (USG) and DEXcell Cement Roof Board are manufactured from Portland cement, lightweight aggregate, or fill, and glass mesh reinforcement.

Panel Application Method

 Hot Asphalt	Maximum panel size of 4 feet by 4 feet.
 Mechanical	Fasten panels at the minimum rate of 1 fastener per 4 square feet of panel area. Contact Siplast for fastening frequencies to meet specific codes/approvals.
 Adhered	See published schematics for Siplast insulation adhesive bead spacing sequences on our website www.siplast.com.

Membrane Direct Application

SBS Modified Bitumen

1. Hot asphalt: Approved. Prime panels using PA-1125 or PA-917 Primer.
2. PA-311 Series and SFT Adhesive: Approved.
3. Torch: Approved. Prime panels using PA-1125 or PA-917 Primer.
4. Self-Adhesive: Approved. Prime panels using PA-1125 or PA-917 Primer.

Thermoplastic

PVC and PVC KEE:

1. Parasolo PVC Bonding Adhesive
2. Parasolo PVC Quick Spray Adhesive
3. Parasolo PVC Quick-lay Adhesive (Not applicable with PVC KEE)
4. Induction Welding
5. Mechanical attachment

TPO:

1. Parasolo TPO Bonding Adhesive
2. Parasolo TPO Quick Spray Adhesive
3. Induction Welding
4. Mechanical attachment

All Thermoplastic Fleece-Back

1. Parafast Adhesive T
2. Type III asphalt

Listings, Approvals, & Standards Note: For liquid applied membranes please contact Siplast Technical Services for additional information

c UL us LISTED FM APPROVED

Refer to UL Products iQ for specific assemblies.
Refer to RoofNav.com for specific assemblies.

High-Density Polyisocyanurate Cover Panel

High-density polyisocyanurate cover panels are produced from polyisocyanurate-based chemicals without blowing agents sandwiched between inorganic coated fiberglass facers.

Panel Application Methods

 Mechanical	Fasten panels at the minimum rate of 1 fastener per 3.2 square feet of panel area. Contact Siplast for fastening frequencies to meet specific codes/approvals.
 Adhered	See published schematics for Siplast insulation adhesive bead spacing sequence on our website www.siplast.com.

Approved H-D Polyisocyanurate Cover Panels

1. Paratherm HD by Siplast
2. EnergyGuard® HD and EnergyGuard® HD PLUS by GAF
3. ACFoam-HD® Coverboard by Atlas Roofing Corp.

Membrane Direct Application

SBS Modified Bitumen

1. PA-311 Series and SFT Adhesive: Approved.
2. Torch: Not Approved.
3. Self-Adhesive: Approved.
4. Hot asphalt modified bitumen roofing to HD polyisocyanurate cover panel is not approved.

Thermoplastic

PVC and PVC KEE:

1. Parasolo PVC Bonding Adhesive
2. Parasolo PVC Quick Spray Adhesive
3. Parasolo PVC Quick-lay Adhesive (Not applicable with PVC KEE)
4. Induction Welding
5. Mechanical attachment

TPO:

1. Parasolo TPO Bonding Adhesive
2. Parasolo TPO Quick Spray Adhesive
3. Induction Welding
4. Mechanical attachment

All Thermoplastic Fleece-Back

1. Parafast Adhesive T
2. Type III asphalt

Listings, Approvals, & Standards

Note: For liquid applied membranes please contact Siplast Technical Services for additional information

c UL us LISTED FM APPROVED

Refer to UL Products iQ for specific assemblies.
Refer to RoofNav.com for specific assemblies.

ASTM C1289: Type II, Class 4, Grade 1: 80-psi
Type II, Class 4, Grade 2: 100-psi

High-Density Fiberboard

High-density fiberboard insulation is a preformed, rigid fibrous panel, composed of wood fibers integrally treated with waterproofing binders. Panels are available coated-one-side, coated-two-sides, and coated-six-sides.

Panel Application Method

	Maximum panel size of 4 feet by 4 feet. The maximum asphalt temperature at the point of application should not exceed 455°F.
	Fasten panels at the minimum rate of 1 fastener per 4 square feet of panel area. Contact Siplast for fastening frequencies and supplemental adhesion to meet specific codes/approvals.
	See published schematics for Siplast insulation adhesive bead spacing sequences on our website www.siplast.com.

Membrane Direct Application

SBS Modified Bitumen

1. Hot asphalt: Approved.
2. PA-311 Series and SFT Adhesive: Approved.
3. Torch: Not Approved.
4. Self-Adhesive: Not Approved.

Thermoplastic

PVC and PVC KEE:

1. Parasolo PVC Bonding Adhesive
2. Parasolo PVC Quick Spray Adhesive
3. Parasolo PVC Quick-lay Adhesive (Not applicable with PVC KEE)
4. Induction Welding
5. Mechanical attachment

TPO:

1. Parasolo TPO Bonding Adhesive
2. Parasolo TPO Quick Spray Adhesive
3. Induction Welding
4. Mechanical attachment

All Thermoplastic Fleece-Back

1. Parafast Adhesive T
2. Type III asphalt

Listings, Approvals, & Standards

Note: For liquid applied membranes please contact Siplast Technical Services for additional information

c UL us LISTED FM APPROVED

Refer to UL Products iQ for specific assemblies.
Refer to RoofNav.com for specific assemblies.

1. ASTM C208
2. ASTM C209
3. ASTM C165

Asphaltic Roof Board

Asphaltic roof board is composed of a material fortified asphaltic core between two layers of fiberglass mat and having a sanded surface or removable plastic separator sheet. Asphaltic roof boards can be used as a substrate/cover panel for torch, cold adhesive, hot asphalt or self-adhesive applications or as a protection panel in a protected membrane assembly.

Panel Application Methods

 Hot Asphalt	Maximum panel size of 4 feet by 5 feet.
 Mechanical	Reviewed on a project-by-project basis. Contact Siplast Technical Services for more information.
 Adhered	See published schematics for Siplast insulation adhesive bead spacing sequences on our website www.siplast.com.

Membrane Direct Application

SBS Modified Bitumen

1. Hot asphalt: Approved.
2. PA-311 Series and SFT Adhesive: Approved.
3. Torch: Approved.
4. Self-Adhesive: Approved. Prime panel using PA-1125 or PA-917 Primer.

All Thermoplastic Fleece-Back

1. Parafast Adhesive T
2. Type III asphalt

Listings, Approvals, & Standards

c UL us LISTED FM APPROVED

Refer to UL Product iQ for specific assemblies.
Refer to RoofNav.com for specific assemblies.

1. ASTM D146
2. ASTM D1204

Perlite/High-Density Perlite

Perlite roof board is an insulation material manufactured from expanded volcanic minerals combined with organic fibers and waterproofing binders designed for use with asphalt based roof systems. The top surface is treated to minimize bitumen absorption and to improve the bond with roofing materials.

Panel Application Methods

	Perlite panels, having a thickness of 3/4 inch or greater, can be applied in hot asphalt. (Perlite panels, having a thickness of 1/2 inch, are not approved for application in hot asphalt.)
	Perlite panels, having a minimum thickness of 1/2 inch, can be mechanically attached. When perlite is mechanically attached over a metal deck, the panel thickness must be sufficient to span the flutes of the metal deck. Siplast minimum fastening requirements for perlite insulation products call for 1 fastener per 2 square feet of panel area. See published schematics for fastening frequencies. Contact Siplast for fastening frequencies to meet specific codes/approvals.
	Contact Siplast for approved applications using insulation adhesive.

Membrane Direct Application

SBS Modified Bitumen

1. Hot asphalt: Approved.
2. PA-311 Series and SFT Adhesive: Approved.
3. Torch: Torch application to minimum 1/2-inch DuraBoard (high density perlite) by Johns Manville can be accomplished following special techniques designed to keep the flame on the roofing product and away from the insulation surface. Flame concentrated directly on high-density perlite panel surfaces may compromise membrane adhesion.
4. Self-Adhesive: Not Approved.

Listings, Approvals, & Standards

c UL us LISTED — Refer to UL Product iQ for specific assemblies.

FM APPROVED — Refer to RoofNav.com for specific assemblies.

ASTM C728. Perlite is available in three basic product formulation types. The first type is the perlite panel consisting of approximately 45% cellulose binder. This formulation is typically manufactured in 1/2-inch panel sizes. The second type is typically formulated with approximately 25% cellulose, and is commonly manufactured into a 3/4-inch or greater panel thickness. The third type is a higher density panel sealed with a special polymerized asphalt emulsion coating over the top surface, which is specifically designed to receive membranes that are torch applied.

siplast
With you every step of the way

Siplast
14911 Quorum Dr., Suite 600
Dallas, Texas 75254-1491
469-995-2200
Email: technicalassistance@siplast.com

In Canada:
201 Bewicke Ave., Suite 208
Vancouver, BC, Canada V7M 3M7
604-929-7687

Customer Service in North America:
Toll Free 1-800-922-8800

siplast.com